GOUVERNEUR TALC-ST LAWRENCE CO. NY ASBESTOS PROBLEM

BACKGROUND

A press report indicated that this county and adjacent Jefferson County have the highest rates of asbestosis in the state (58 known or suspected cases versus 34 for the rest of the state). The state Department of Health has begun a screening program in the area to examine X-ray records to locate additional cases and to determine ambient exposure to asbestos.

An EPA literature search revealed that NIOSH has conducted studies in the area over a number of years. They had concluded that the "talc" mined at Gouverneur Talc was predominately (over 50%) asbestos and that a significant number of asbestos induced lung diseases appeared among workers at the plant.

A review of EPA regulations revealed that when NESHAPS regulations were promulgated in 1973 for asbestos mines and mills talc mines were excluded from the regulation. According to the background document for the regulation this was done because the intent was to regulate asbestos mines not mines that produced another mineral where asbestos was an incidental contaminant. The Stationary Source Compliance Division (SSCD) was asked to comment on our situation. After confering with RTP SSCD offered the opinion that if what was shipped was asbestos, calling it talc didn't make it talc and that we should consider it asbestos. The intent of the original regulation was to exclude minerals where asbestos was a contaminant at around the 1% level. This percentage was not explicit in the regulation, the preamble or the background documents. We have asked SSCD to provide written confirmation of this.

A sample of talc distributed in commercial channels was obtained. Preliminary analysis by ESD indicated that the sample was 10 to 20% asbestos.

FOLLOW UP

DEC Region 6 was contacted. They indicated that they were aware of the DOH investigation. No action against the source was planned because Gouverneur was attempting to get the OSHA regulations changed so that their product would no longer be considered asbestos. Action was not considered warranted until this was resolved. The regional office was convinced to stop issuance of a permit to a new mine until the asbestos issue was addressed in the EIS for the mine.

EPA inspections of the plant were conducted in May and August 1984. It appears that milling operations with minor exceptions can comply with the NESHAPS regulations if they are found to be applicable. Mining operations, storage and roadways are not covered under NESHAPS. At the time the regulations were promulgated it was decided that OSHA and Bureau of Mines regulations would adequately restrict asbestos emissions from these sources so that no additional regulation was necessary. Heavy rains in May precluded observation of conditions of the roads etc. It was suspected that operations were dusty. The August inspection confirmed this. No adequate fugitive dust controls are implemented. Water is occasionaly spread by a truck and waste crank case oil is spread in some areas. DEC Region 6 has taken no action since our initial expression of concern that the roadways might be a problem.

SUGGESTED RESOLUTION

EPA has no authority under the NESHAPS regulations (if they apply) or under the SIP to control dust from mining or the roadways. DEC has the authority to control such emissions under 6NYCRR 211. We suggest a meeting with DEC and DOH to discuss the problem and to attempt to get a commitment from DEC to control the roadway and mining dust. If DEC does not control the asbestos dust Section 303 might be used as a vehicle to obtain control. To determine the course this action should take it should be proceeded by a section 114 letter requesting data concerning production rates and composition of the product lines of this company.

OTHER CONSIDERATIONS

The product from this plant is being distributed as talc. It is used in a number of consumer products such as paint, spackle, rubber, ceramics and cosmetics as a filler. Consumer Product Safety Commission regulations prohibit use of asbestos or asbestos containing material in many applications. NESHAPS regulations prohibit visible emissions from manufacturing and fabricating operations involving asbestos under a number of circumstances. By labeling the material produced by Gouverneur as talc broad public exposure to asbestos may be occuring without the knowledge of those involved.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE: AUG 15 1984

SUBJECT: Asbestos Determination - Amsterdam Color Works

FROM: Irwin Katz, Microbiologist T. Tillinfa
Biology Section

TO: Dennis Santella, Chief
New York/Virgin Islands Section (AWM-AC)

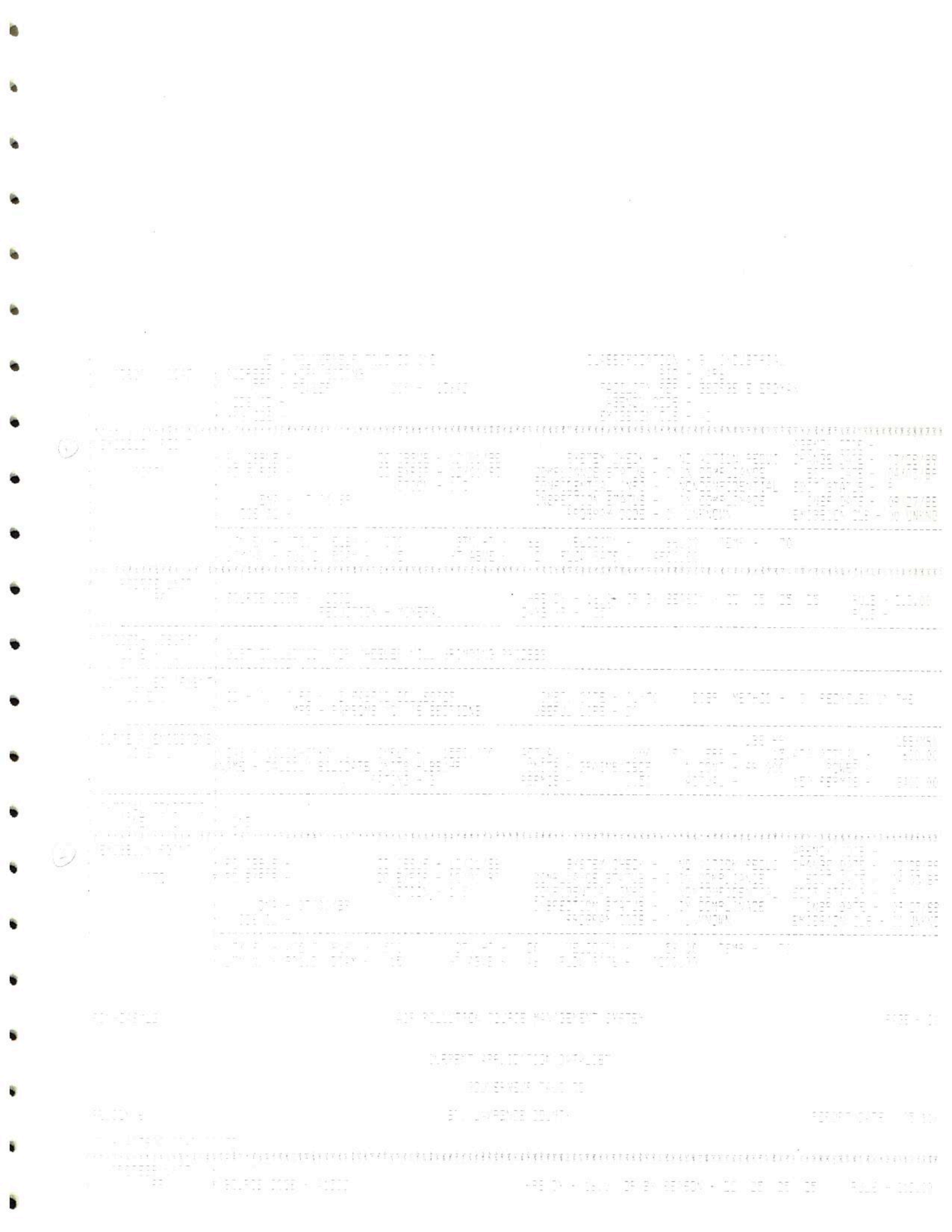
THRU: Thomas Fikslin, Chief T. Till
Biology Section (ES-TS)

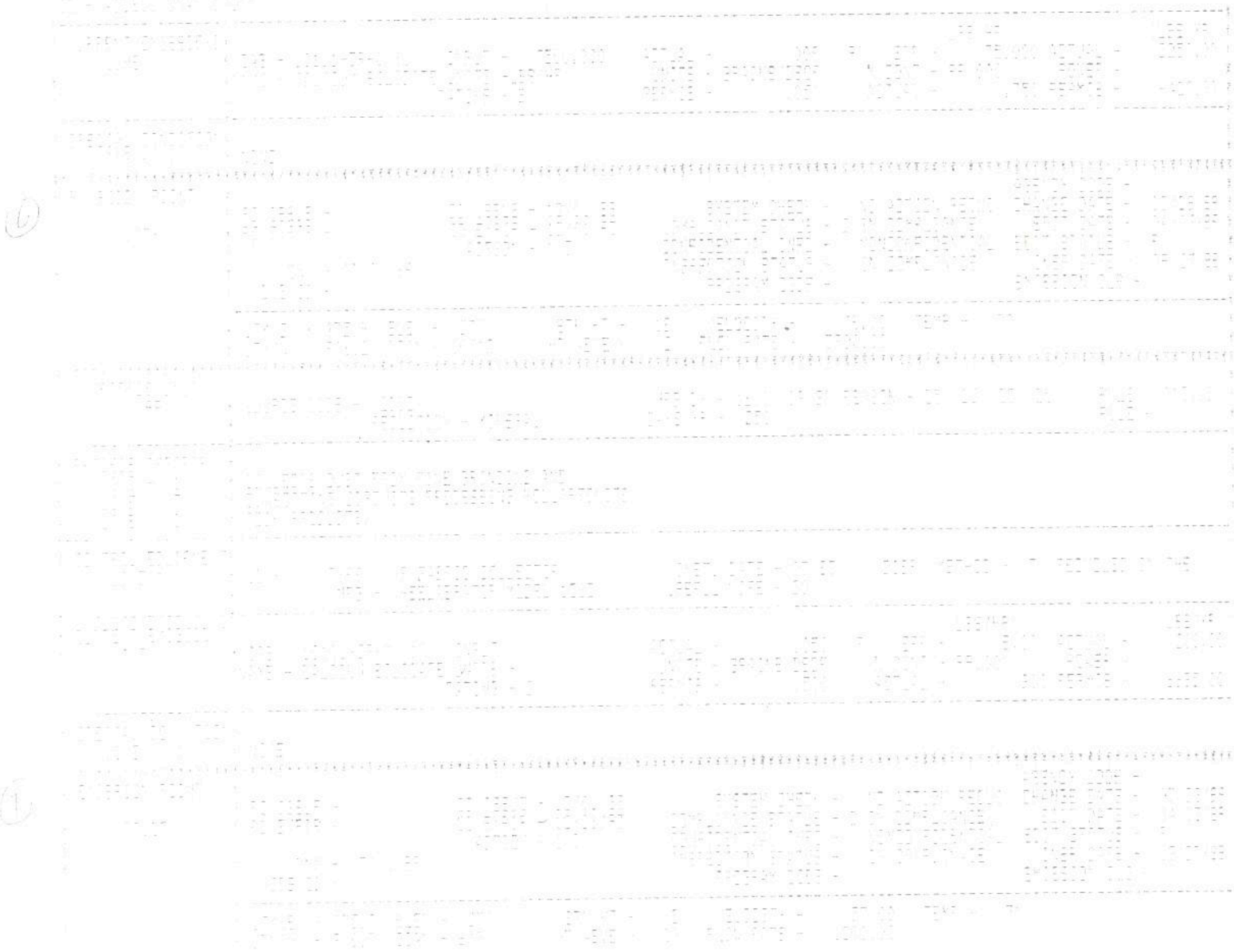
The technique employed to detect the presence of asbestos utilized a Leitz polarized light microscope (PLM) supplemented with dispersion staining (DS). Results are as follows:

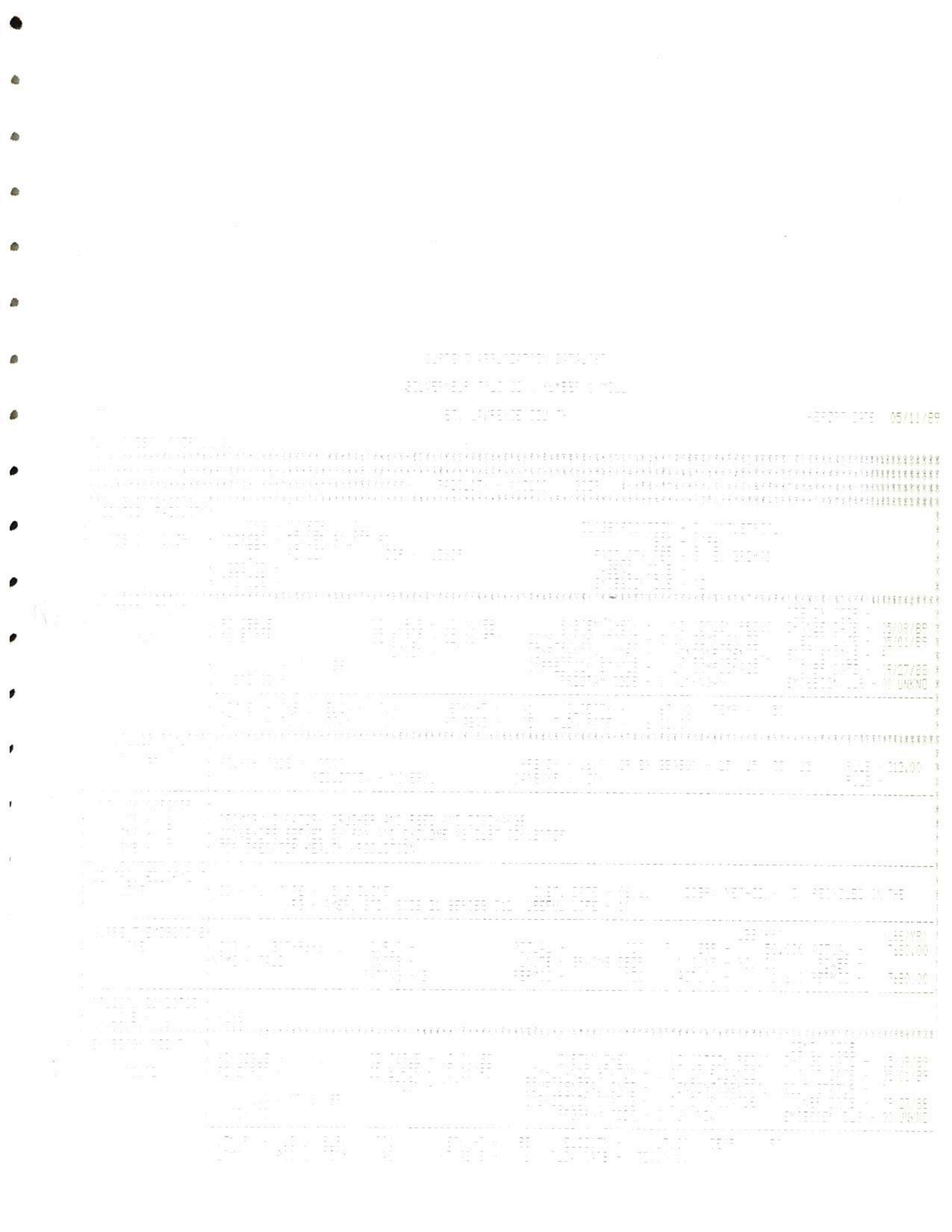
EPA Sample No. 67708, Amsterdam Color Works, Inc., Bronx, N.Y.

$n_D^{25°C}$ Index of Refraction Liquids	Orientation perpendicular(⊥) to the polarizer Wavelength	Orientation parallel (||) Wavelength
1.585	430	430
1.605	625	430

The sample contained the asbestos mineral tremolite. Visual estimation percentage of tremolite in the sample is between 10-20%. Concentration was determined by visual percentage estimation using several microscopic fields. Percentage estimation is made concurrently with the (DS) identification using the various refractive index liquids.







J. Copeland

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OCT - 5 1984

MEMORANDUM

OFFICE OF
AIR AND RADIATION

SUBJECT: Clarification of Talc Milling and Asbestos

FROM: Director
Stationary Source Compliance Division
Office of Air Quality Planning and Standards

TO: Francis W. Giaccone, Chief
Air Compliance Branch, Region II

This is in response to your August 8, 1984 request for clarification of an applicability determination pertaining to talc milling. The issue of concern is whether talc milling operations should be considered asbestos mills, which would subject them to the asbestos NESHAPs provisions of §61.142.

The issue arose because Region II is involved with a talc mining and milling company, Gouverneur Talc, which processes talc with an asbestos content greater than 50 percent by weight. You believe that the talc mined and milled at Gouverneur should be considered asbestos because of the high content of tremolite, anthophyllite, and chrysolite, and should be subject to the asbestos mill regulations. You request a review of the background of 1973 applicability determination B-1, which said talc milling operations should not be considered asbestos mills, and our comments on the applicability of the asbestos NESHAPs to Gouverneur Talc.

After careful review, SSCD and ESED have concluded that the talc milling operation at issue is not covered under the current NESHAPs. The document "Background Information--Proposed NESHAP for Asbestos" (APTD-0753, December 1971) states on page 6, "other asbestos emission sources are now under study for possible inclusion within proposed standards at a future date. Included in these studies are roadways paved with asbestos-asphalt concrete and talc mines, in which asbestos occurs as a natural contaminant." This is re-iterated in the May 3, 1974 (39 FR 15396) promulgation of revisions to the asbestos standard, which stated that neither talc mines nor manufacturing operations using talc contaminated with asbestos were covered

by the standard. The information available at the time of promulgation did not demonstrate that talc milling was a major source of asbestos emissions. Additionally, EPA was uncertain whether there were any mineralogical differences between the asbestos in talc and milled asbestos.

It is true that EPA did not anticipate the high percentage of asbestos in the talc, believing it would be on the order of 20%. However, based on the background material available, we must conclude the standard did not intend to apply and does not currently apply to the situation, unless Gouverneur Talc converts the ore into commercial asbestos.

Because of the potential for asbestos exposure, SSCD has suggested that ESED review the talc issue in conjunction with a similar review of asbestos impurities in vermiculite. I urge you to inform ESED of your interest in such a review.

Should you have any questions on this determination, please contact Robert Myers at (FTS) 382-2875.

Edward E. Reich

cc: John Copeland
Edward Nowak
Terrell Hunt

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE: Aug 8, 1984

SUBJECT: Request for Clarification of Talc Milling Operations and Asbestos.

FROM: Francis W. Giaccone, Chief
Air Compliance Branch
Air & Waste Management Branch

TO: Edward Reich, Director
Stationary Source Compliance Division

Region II is requesting clarification of a determination pertaining to talc milling which was previously addressed on April 26, 1973. The issue of concern is whether talc milling operations should be considered asbestos mills (question B-1 of the NESHAP summary of appliability determinations). SSCD stated that they should not be considered asbestos mills and therefore should not be subject to section 61.22(a) of the NESHAPS regulations which pertain to asbestos mills. It is our understanding that SSCD based this decision on the fact that talc only contains some small percentage of asbestos that is not significant enough to be subject to the regulation.

Region II requests that SSCD clarify the background for this determination. We are involved with a talc mining and milling company, known as Gouverneur Talc, which processes talc with an asbestos content greater than 50 percent by weight. This analysis was reported in a field study performed by NIOSH and documented in a February 1980 report entitled "Occupational Exposure to Talc Containing Asbestos (DHEW NIOSH Publication No. 80-115). We have enclosed the report to assist with your review. In addition we have enclosed a newspaper article reporting that the county this source is located in has the highest rate of asbestosis in New York State.

It should be mentioned that the OSHA definiton of asbestos is not consistent with EPA's. The OSHA definition does not consider tremolite and other minerals defined by EPA as asbestos unless the fibers are longer than 5 micrometers. EPA does not include such a limitation in its definition. Currently Gouverneur Talc and OSHA are at issue with regards to the sizing standard and the NIOSH report (please refer to the newspaper articles enclosed). One issue of concern relates to the proposed changes to the OSHA asbestos sizing standards. The proposed asbestos rule would define asbestos as any one of a list of minerals with a length-to-width ratio of three to one or larger. The difference in definitions between EPA and OSHA may affect future enforcement cases; two federal agencies with two separate definitions for the same material. Region II recommends that SSCD offer public comments during the public hearing period for the proposed rule.

Region II believes that the talc which is being mined and milled at Gouverneur should be considered asbestos because of the high content of tremolite, anthophyllite, and chrysolite, and should, therefore, be subject to the asbestos mill regulations under the NESHAP standards. During a recent inspection of the company, Region II took a talc ore sample for analysis to substantiate the NIOSH findings. In addition, we have obtained a 50 pound bag of talc from a paint manufacturer. Talc from Gouverneur is used in the manufacturing of paint, spackle, plastics, rubber, ceramic material, and cosmetics. To date, we have only received verbal results on the 50 pound bag sample from our laboratory. The asbestos content is greater than 10 percent and may be as high 20 percent. It should be noted that Gouverneur has a number of mines which are being excavated for the various talc minerals. Each of these minerals have different asbestos contents. The final asbestos content of the shipped talc will depend upon the mixture of these minerals.

Region II also believes that companies using this material should be subject to the manufacturing and fabrication sections of the NESHAP regulations.

Region II would appreciate an SSCD review of the background of the 1973 determination and comments on the applicabilty of the NESHAPS to our specific case. Due to the nationwide implications of this decision (eg. other talc mines and manufacturers using talc from Gouverneur) and the prior SSCD determination, we believe SSCD should provide a ruling.

If you have any questions, your office my contact Edward Nowak or Dennis Santella of my staff at FTS 264-0994 or 264-9628, respectively.

cc: Richard Biondi
Edward Nowak
Dennis Santella
Warren Llewellyn

State to Investigate Asbestosis in 2 Counti. ,

Special to The New York Times

ALBANY, March 24 — Citing "major public health concerns," the State Health Commissioner has ordered an investigation into an outbreak of 58 confirmed and suspected cases of asbestosis, a lung disease, in two upstate counties.

Earlier this week the Commissioner, Dr. David Axelrod, instructed six hospitals within the two counties, Jefferson and St. Lawrence, to open for inspection the X-rays of 1,200 patients, most of them men over the age of 40, to determine if any had been exposed to asbestos, a substance used widely for insulation and fireproofing.

Peter Slocum, a Health Department spokesman, said exposure to asbestos particles found in talc mined in the area is "our leading suspect." Twenty-four of the victims have worked in the area's talc mining and aluminum industries.

Aluminum foundries in St. Lawrence County were cited by state investigators "for excessive airborne contamination" in inspections between 1963 and 1975.

Link to Cancer Seen

Dr. Nicholas J. Vianna, director of the Health Department's Division of Health Risk Control, said investigators would also try to establish whether area residents in general "are at high risk for asbestosis, mesothelioma and other related disorders."

Asbestosis can lead to mesothelioma, which Dr. Vianna described as "a respiratory cancer that is usually lethal within one year of detection." He said the department's inquiry would take about a year.

Of the 24 confirmed victims of asbestosis, seven have died within the last year and a half. They and 34 other people suspected of having the disease were discovered through routine X-ray examinations between March 1982 and March 1983 at A. Barton Hepburn Hospital in Ogdensburg in St. Lawrence County, the Health Department said.

By comparison, only 35 cases were reported by all other hospitals in the state over the last year. In Manhattan, for example, one case of asbestosis was reported.

Outbreak Called 'Alarming'

Dr. Vianna described the concentration of the disease in northern New York as "abnormally high" and "sufficiently alarming" to warrant an in-depth investigation.

If the investigation shows that asbestosis in the region stemmed from occupational hazards, the department will undertake "an educational program" urging mine workers and others to be examined by their doctors, Dr. Vianna said.

If the department finds that workers in the region are still being exposed to asbestos, it will notify Federal agencies charged with protecting employees against asbestos exposure, he said.

Records of persons over 40 were selected, Dr. Vianna said, because it often takes 10 to 15 years after exposure to asbestos for its presence in the lungs to be detected.

Memo Describes Problem

In a Health Department memorandum dated Feb. 6, Dr. Vianna said the inquiry would try to determine "the magnitude of the occupational lung problem in the entire St. Lawrence County area."

"It is highly unlikely that this problem is limited only to those individuals seen at A. B. Hepburn Hospital," the memo said.

The department has already completed extensive interviews with most of the disease victims and surviving family members to determine their work experience. In 20 cases, however, state investigators have been unable to find any occupational exposure to asbestos or other cancer-linked agents to explain the presence of the disease, Dr. Vianna said.

New York ⇒ Gouverneur

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

NOV 16 1984

OFFICE OF
AIR AND RADIATION

MEMORANDUM

SUBJECT: NESHAPs Applicability -- Gouverneur Talc

FROM: Director
Stationary Source Compliance Division
Office of Air Quality Planning & Standards

TO: Francis W. Giaccone, Chief
Air Compliance Branch, Region II

This is in response to your November 2, 1984 request for an applicability determination. The request involves the applicability of the asbestos NESHAPs provisions to the Gouverneur Talc facility located in New York State. In an October 5, 1984 determination issued by this office it was concluded that Gouverneur was not subject to the asbestos regulations because it was mining and milling only talc; asbestos was believed to be merely a contaminant. New information supplied by you and your staff indicates the situation is quite different, and we have reexamined the issues involved.

The new information centered around two points. First, it was found the company does not mine and mill talc, but rather tremolite, with talc a contaminant. Tremolite in its fibrous form is considered asbestos. Second, the company continues to claim that the procedure EPA uses to determine if tremolite is asbestos (using polarized light microscopy to define an aspect ratio) is inaccurate. However, a reanalysis of the sample has shown that in addition to tremolite, it contains at least 7 percent fibrous chrysotile asbestos. No problems are claimed with the method used when analyzing chrysotile. You believe these two additional points change the applicability situation, and request our concurrence that Gouverneur Talc is subject to the milling standard of §61.142, and their product (trade name NYTALC) is commercial asbestos. SSCD concurs with your conclusion. Asbestos mill is defined as "any facility engaged in converting, or in any intermediate step in converting, asbestos ore into commercial asbestos." Commercial asbestos is any asbestos extraced from asbestos ore. There is no minimum cut-off for the amount of asbestos necessary to be present for an ore to be asbestos ore. Page 3-1 of the document

used for fillers of paint

Asbestolith

"Control Techniques for Asbestos Air Pollutants" (AP-117, February 1973) states:

> The concentration of asbestos in commercial ores is as large as 60 percent in California's short fiber Coalinga ores, but the largest deposits of longer fiber chrysotile contain from 4 to 10 percent asbestos.

The ore mined by Gouveneur Talc contains at least that much asbestos and hence is asbestos ore. Since Gouverneur converts this ore into commercial asbestos (tremolite and chrysotile are asbestos and they are extracted from asbestos ore), Gouverneur fulfills the definition of an asbestos mill. It is thus subject to the provisions of §61.142. Since the product NYTALC is commercial asbestos, any source performing one of the manufacturing or fabricating operations enumerated under §61.144 or §61.149 would also be subject to the applicable asbestos NESHAPs provisions.

This determination has the concurrence of the Office of Enforcement and Compliance Monitoring and the Emission Standards and Engineering Division. If you have any questions, contact Robert Myers at FTS 382-2875.

Edward E. Reich

cc: Elliott Gilberg
Earl Salo
John Copeland
Bob Ajax
Dennis Santella

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
ATMOSPHERIC SCIENCES RESEARCH LABORATORY
RESEARCH TRIANGLE PARK
NORTH CAROLINA 27711

COPIES TO
E. NOWAK
J. DAVIS (AEC)
D. STONE
OK

MEMORANDUM

DATE: March 13, 1985

SUBJECT: Your Request for Analysis of the R.T. Vanderbilt Co. Talc Sample

FROM: John Miller, Electron Microscopist
Special Techniques Group

TO: Mike Beard, EMSL

An analysis of this sample by TEM and SEM EDX showed the following.

1. One crystal of chrysotile asbestos was found during the examination of two specimen grids. Therefore, it is concluded that chrysotile is not a significant factor in the mineral population of this sample.

2. Tremolite is found in fair abundance, mostly as the non-fiberous type. However, cleavage fragments approaching the classic "fiber" description are numerous. Some fiberous tremolite was found.

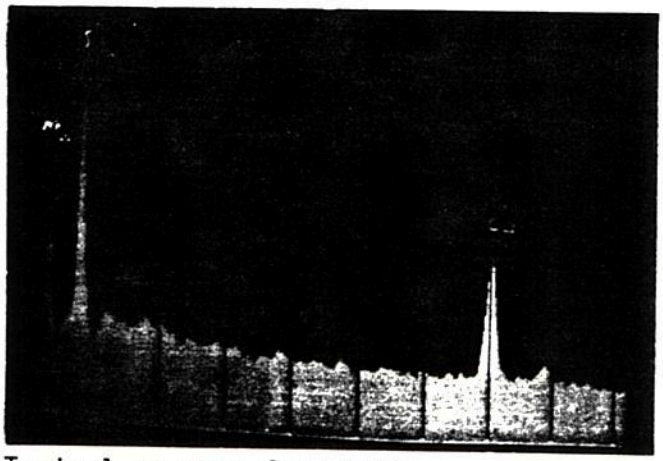
3. The sample had abundant fibers as shown in the micrographs which upon examination of EDX showed only magnesium and silicone. The morphology showed no resemblance to chrysotile and therefore are most likely fiberous talc, since their EDX is not that of tremolite.

SAED was not performed because of the time consuming requirement of this form of analysis.

The copper shown in the EDX spectrum is from the sample support grid.

R.T. Vanderbilt Sample # 67708
Transmission Electron Micrographs

7700X Magnification



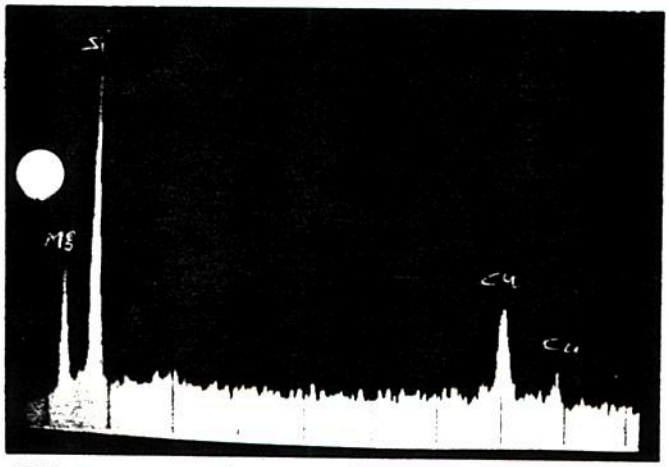
Typical spectra from long, thin fibers shown in micrographs at left. Copper is from the specimen grid.

9700X Magnification

Figure #1

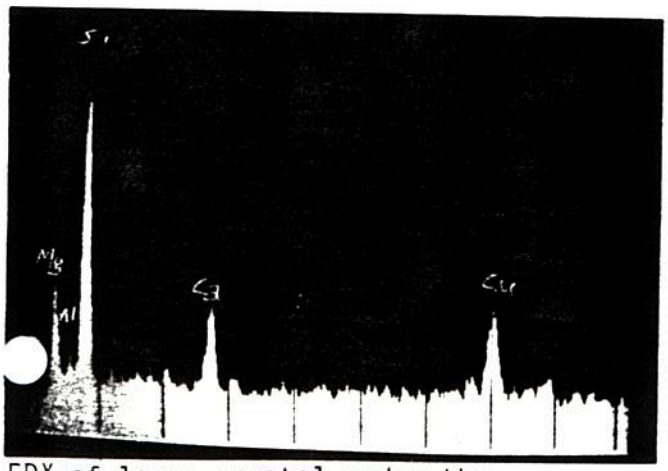
R.I. Vanderbilt Sample # 6//08

TEM micrographs
9700X Magnification

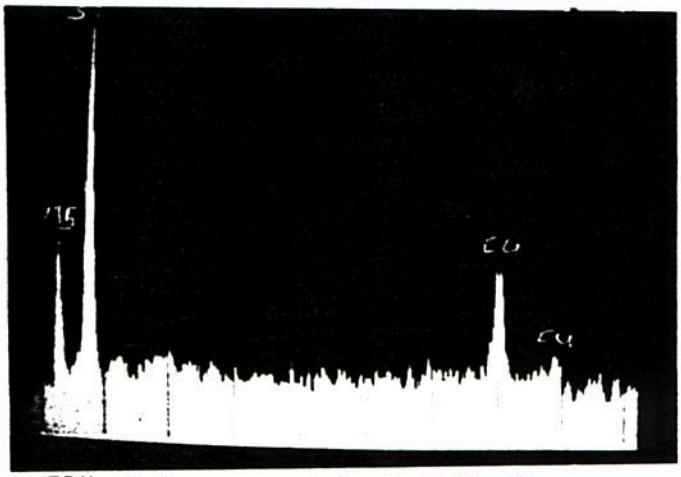


EDX spectra of crystal crossing
large crystal in micrographs

SEM micrograph
6000X Magnification

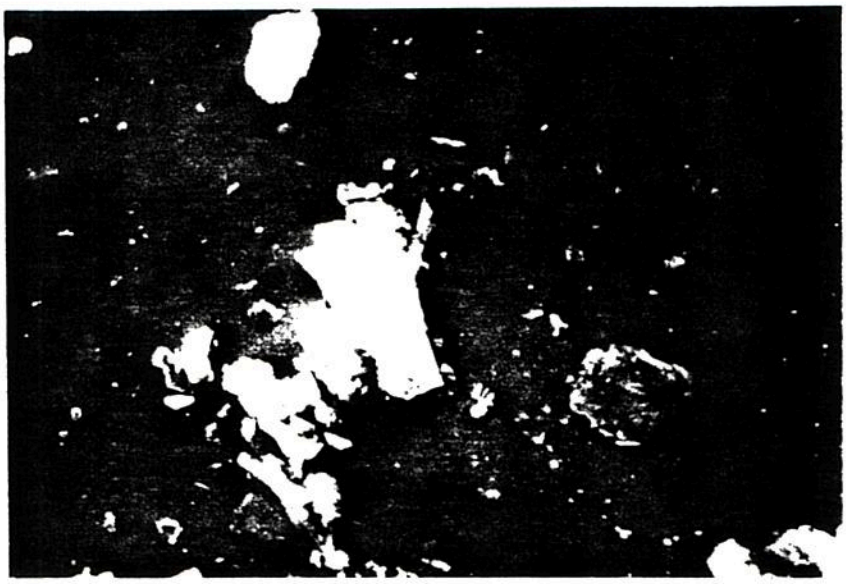


EDX of large crystal under the
long one in micrographs

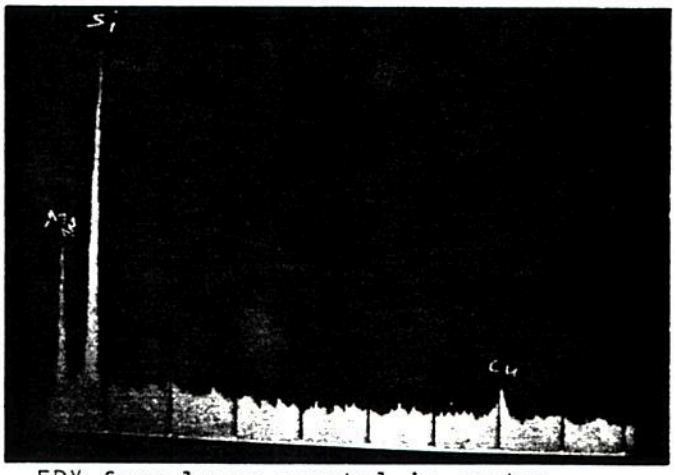


EDX of long crystal at left of
crossed crystals

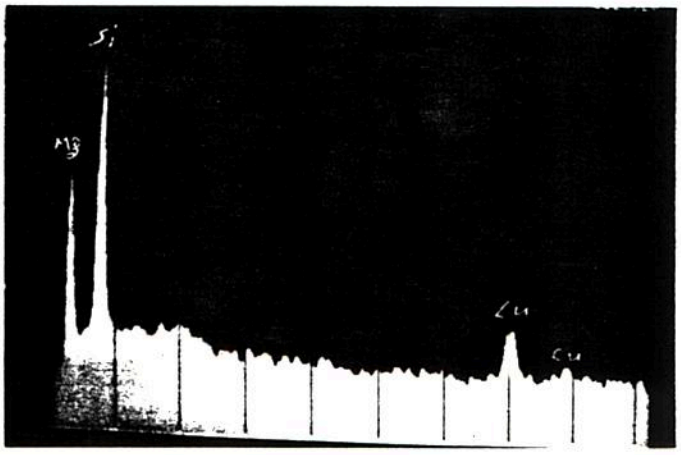
Figure #2



SEM micrograph of platy crystals (Talc)
in sample # 67708



EDX from large crystal in center
of micrographs



EDX from gray crystal in
micrographs

Figure #3

ROUTING AND TRANSMITTAL SLIP		ACTION
1 TO (Name, office symbol or location)	INITIALS	CIRCULATE
Irwin Katz	DATE	COORDINATION
2	INITIALS	FILE
	DATE	INFORMATION
3	INITIALS	NOTE AND RETURN
	DATE	PER CONVERSATION
4	INITIALS	SEE ME
	DATE	SIGNATURE

REMARKS

Irwin,

Enclosed are the samples you sent to RTI and to EPA for analysis, and the analytical results. RTI used PLM for the analysis and EPA used TEM/EDX. If you have any questions regarding these analyses, please call.

MKB.

Do NOT use this form as a RECORD of approvals, concurrences, disapprovals, clearances, and similar actions.

FROM (Name, office symbol or location)	DATE
Mike Beard	3/14/85
	PHONE FTS 629 2623

OPTIONAL FORM 41
AUGUST 1967
GSA FPMR (41CFR) 100-11.206

GPO 043—16—81418-1 419-015 5041-101

[redacted]

Memorandum

~~To:~~ Date: 2-22-'85

~~From:~~ "NYTALC 200" Gouverneur Talc. Sample #67708.

PLM analysis. No point count quantitation. Visual estimation to confirm GCA's quantitation in general terms only.

Contains: ~~C~~ tremolite and tremolite-actinolite. Aspect ratios (3:1 and 10:1) percentages by GCA appear in range. Some anthophyllite. Also contains serpentine but no chrysotile was seen.

Asbestos Information Service/Referral Form

Contact Name: Erwin Katz

Affiliation: Governor Talc sample.

Address:

Telephone: 201 321-6715 ext. ____

Source of Contact

- ☐ Laboratory
- ☐ School
- ☐ Local/State Government
- ☐ Engineer
- ☐ Lawyer
- ☐ Federal Government
- ☐ Private Individual
- ☐ Contractor/Architect
- ☐ Other

Type of Information Requested

- ☐ Lab List
- ☐ Interim Method
- ☐ OTS/IA Office (800) 424-9065
- ☐ State/Regional Coordinator(s)
- ☐ NTIS (703) 487-4650
- ☐ CPSC (800) 638-2772
- ☐ Solid and Hazardous Waste Agencies
- ☐ DOT—Hazardous Materials (202) 426-2075
- ☐ Cancer Information Service (800) 422-6237
- ☐ USDOL/OSHA
- ☐ NIOSH
- ☐ EPA-QA
- ☐ Technical Sampling and Analysis
- ☐ Consulting Service(s)
- ☐ Information Search
- ☐ Other

Notes/Summary/Comments/etc.: See attached. Also discussed need for definition, quantitation techniques, etc.

Information Provided by: [signature] Date: 2/12/85

Mailed by: ____ Date: __/__/__

INDUSTRIAL HYGIENE STUDY OF THE GOUVERNEUR TALC COMPANY NUMBER ONE MINE AND MILL BALMAT NEW YORK. PB81-224719

DEMENT, J. M.; ZUMWALDE, R. D.

CORP. SOURCE- NATIONAL INST. FOR OCCUPATIONAL SAFETY AND HEALTH, CINCINNATI, OH. DIV. OF SURVEILLANCE, HAZARD EVALUATIONS AND FIELD STUDIES. JOURNAL VOL.- U8123 DESCRIP. NOTE- INDUSTRYWIDE STUDY (FINAL) REPORT DATE- OCT 76 PAGINATION- 37P REPORT NO.- IWS-36.128 NTIS PRICES- PC A03/MF A01

SAMPLES OF BULK TALC (14807966) PRODUCED BY THE R. T. VANDERBILT GOUVERNEUR TALC COMPANY (SIC-1496) NUMBER ONE MINE IN BALMAT, NEW YORK, WERE COLLECTED AND ANALYZED FOR ASBESTOS (1332214) CONTENT ON DECEMBER 12, 1975. TEN MILLIGRAMS OF EACH SAMPLE FROM SEVEN TALC SUPPLIERS WERE PREPARED AND ANALYZED BY TRANSMISSION ELECTRON MICROSCOPY. ASBESTIFORM ANTHOPHYLLITE (1332214) AND FIBROUS TREMOLITE (1332214) COMPRISED 67 TO 88 AND 4 TO 12 PERCENT OF THE FIBERS PRESENT IN THE SAMPLES, RESPECTIVELY. CHRYSOTILE (1332214) WAS FOUND IN TRACE AMOUNTS IN TWO OF THE SEVEN SAMPLES ANALYZED. RECOMMENDATIONS WERE MADE TO APPLY ASBESTOS WARNING LABELS TO THE SEVEN BULK TALCS.

RESULTS OF U.S.P.H.S. SURVEY AT AMERICAN BRAKE SHOE WINCHESTER VIRGINIA. PB81-224701

CORP. SOURCE- NATIONAL INST. FOR OCCUPATIONAL SAFETY AND HEALTH, CINCINNATI, OH. DIV. OF SURVEILLANCE, HAZARD EVALUATIONS AND FIELD STUDIES. JOURNAL VOL.- U8123 DESCRIP. NOTE- INDUSTRYWIDE STUDY. REPORT DATE- MAY 71 PAGINATION- 11P REPORT NO.- IWS-32.25C NTIS PRICES- PC A02/MF A01

AIR SAMPLING FOR ASBESTOS (1332214) DUST WAS CONDUCTED BY THE UNITED STATES PUBLIC HEALTH SERVICE AT THE AMERICAN BRAKE SHOE COMPANY (SIC-3292) IN WINCHESTER, VIRGINIA, DURING MAY, 1971. THE CONCENTRATION OF FIBERS GREATER THAN 5 MICRONS IN LENGTH PER CUBIC CENTIMETER (F/CC) RANGED FROM UNMEASUREABLE TO 8.4F/CC FOR THE MIXING, COATING, AND EXTRUDING AREA; UP TO 5.2F/CC FOR THE FORMING AREA; 0.1 TO 7.0F/CC FOR HOT PRESSING OPERATIONS; 0.3 TO 2.1F/CC FOR THE BAKING AREA; 0.2 TO 17.5F/CC FOR GRINDING AND SANDING OPERATIONS; UP TO 5.4F/CC FOR THE CUTTING AND DRILLING WORK

June 28, 1985

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II

DATE: JUN 2 0 1985

SUBJECT: Request for Assistance - RT. Vanderbilt Asbestos Analysis Results

FROM: F. W. Giaccone, Chief
Air Compliance Branch
Air and Waste Management Division

TO:
Michael E. Beard
Methods Standardization Branch
Quality Assurance Division
Environmental Monitoring Systems Laboratory

Region II would like to thank you for your assistance in the analysis of the talc sample from the R.T. Vanderbilt Company forwarded to you by this office. In addition to your analysis, we have received results from two other organizations: GCA Corporation and the New York State Department of Health (attached). There is a wide divergence of opinion as to what are the constituents of the sample. GCA found asbestos material in the form of chrysotile and tremolite. New York State found asbestiform anthophylite. Mr. John Miller of the Special Techniques Group found the material to be fibrous tremolite and fibrous talc ("super talc"). We would appreciate your assistance in the interpretation of these results and any recommendations you may have on the follow-up actions to be taken.

Region II is considering either additional analysis of the sample by other laboratories which are qualified to perform asbestos analysis or finding an expert in the field of mineralogy who is also capable of performing the asbestos analysis. This may help in the resolution of the question pertaining to "super talc" which the company contends is their product. Any recommendation you may have for selection of such an expert would be appreciated. Vanderbilt has also requested a sample of the material that we tested for their own analysis by Dr. Ann Wylie at the University of Maryland.

If you have any questions, please contact Edward Nowak of my staff at (FTS) 264-0994.

cc: E. Nowak, 2AWM-AC
I. Katz, ES-TS
D. Stone, 2ORC-AIR
D. Santella, 2AWM-AC
F. W. Giaccone, 2AWM-AC
M. Kantz, ES-SM

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
ATMOSPHERIC SCIENCES RESEARCH LABORATORY
RESEARCH TRIANGLE PARK
NORTH CAROLINA 27711

COPIES TO
E. NEWAK
J. DAVIS (A
D. STRA

MEMORANDUM

DATE: March 13, 1985

SUBJECT: Your Request for Analysis of the R.T. Vanderbilt Co. Talc Sample

FROM: John Miller, Electron Microscopist
Special Techniques Group

TO: Mike Beard, EMSL

An analysis of this sample by TEM and SEM EDX showed the following.

1. One crystal of chrysotile asbestos was found during the examination of two specimen grids. Therefore, it is concluded that chrysotile is not a significant factor in the mineral population of this sample.

2. Tremolite is found in fair abundance, mostly as the non-fiberous type. However, cleavage fragments approaching the classic "fiber" description are numerous. Some fiberous tremolite was found.

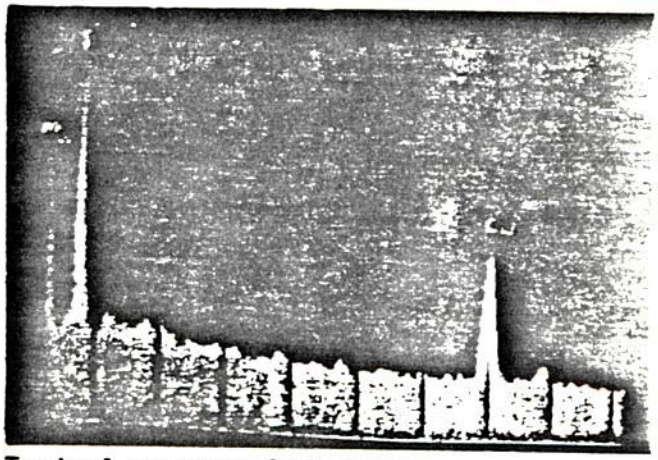
3. The sample had abundant fibers as shown in the micrographs which upon examination of EDX showed only magnesium and silicone. The morphology showed no resemblance to chrysotile and therefore are most likely fiberous talc, since their EDX is not that of tremolite.

SAED was not performed because of the time consuming requirement of this form of analysis.

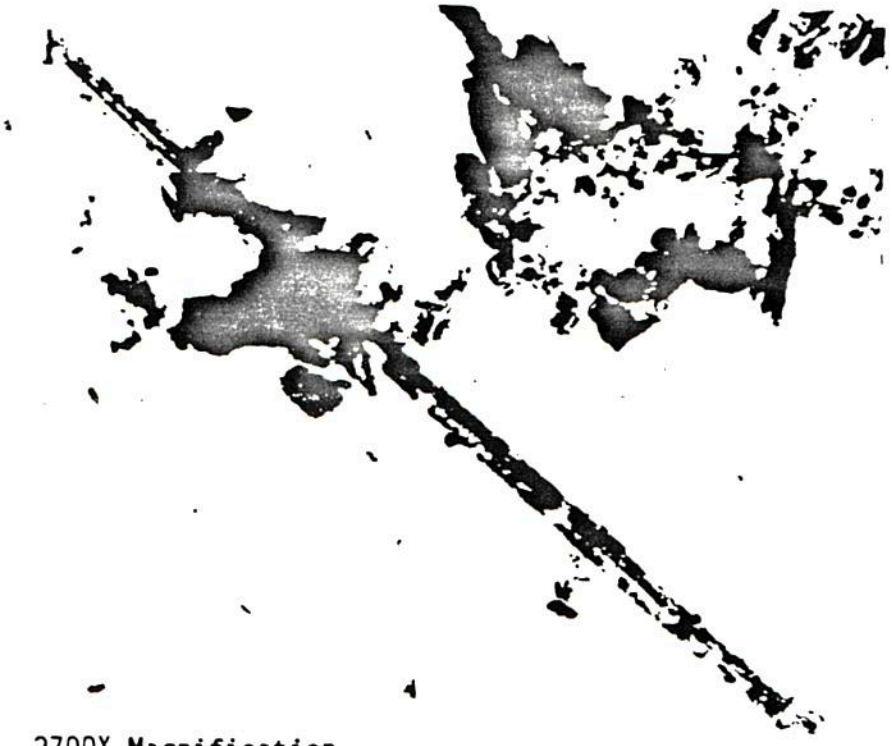
The copper shown in the EDX spectrum is from the sample support grid.

R.T. Vanderbilt Sample # 67708
Transmission Electron Micrographs

7700X Magnification



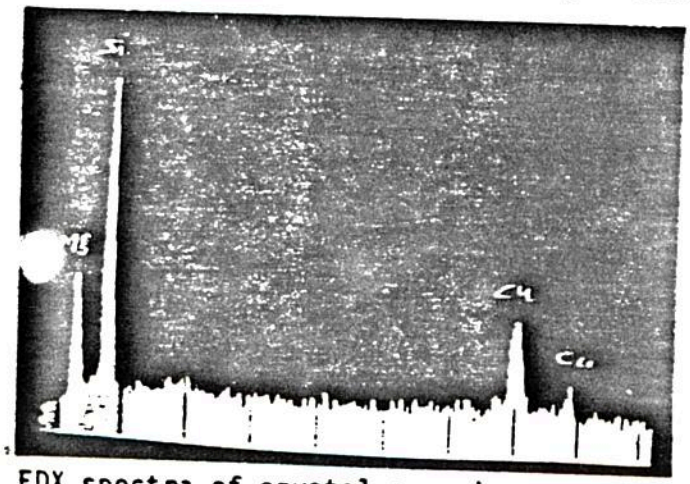
Typical spectra from long, thin fibers shown in micrographs at left. Copper is from the specimen grid.



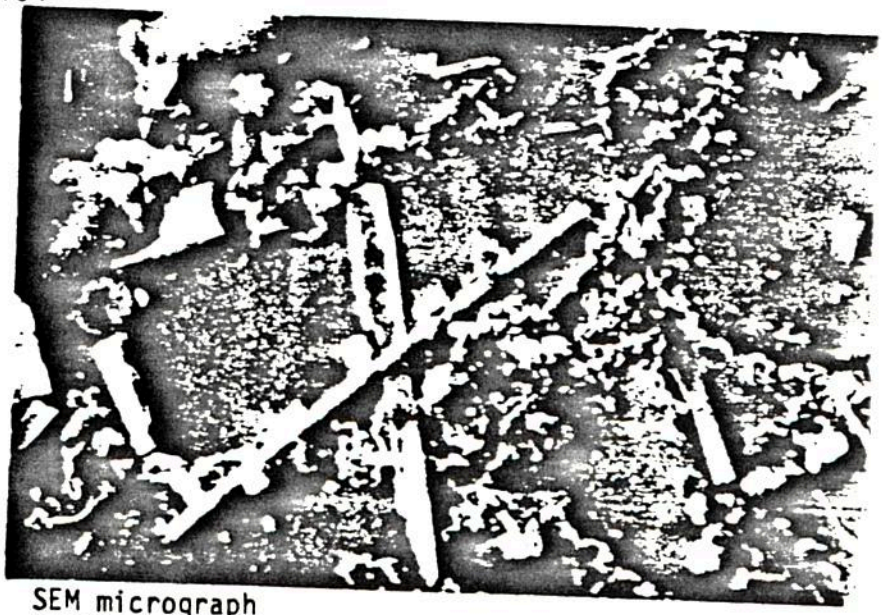
7700X Magnification

Figure #1

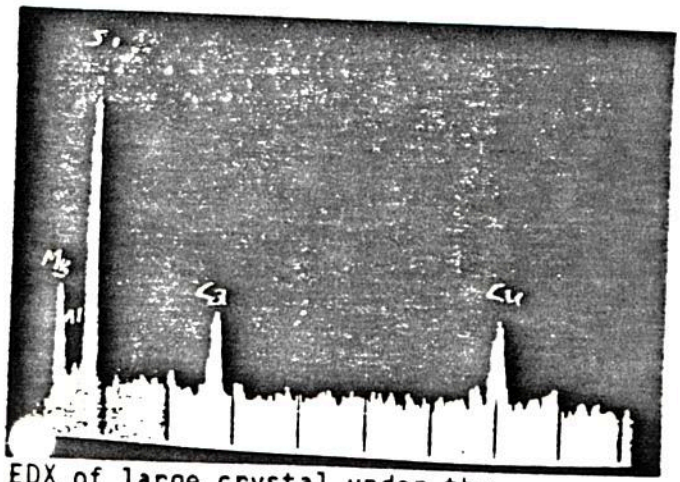
TEM micrographs
9700X Magnification



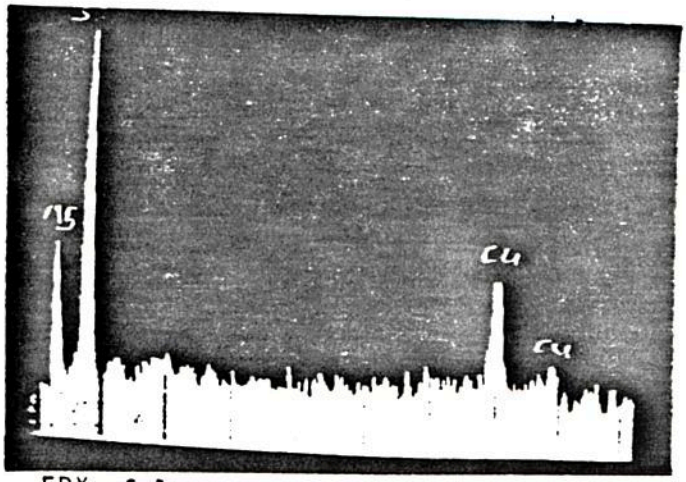
EDX spectra of crystal crossing
large crystal in micrographs



SEM micrograph
6000X Magnification



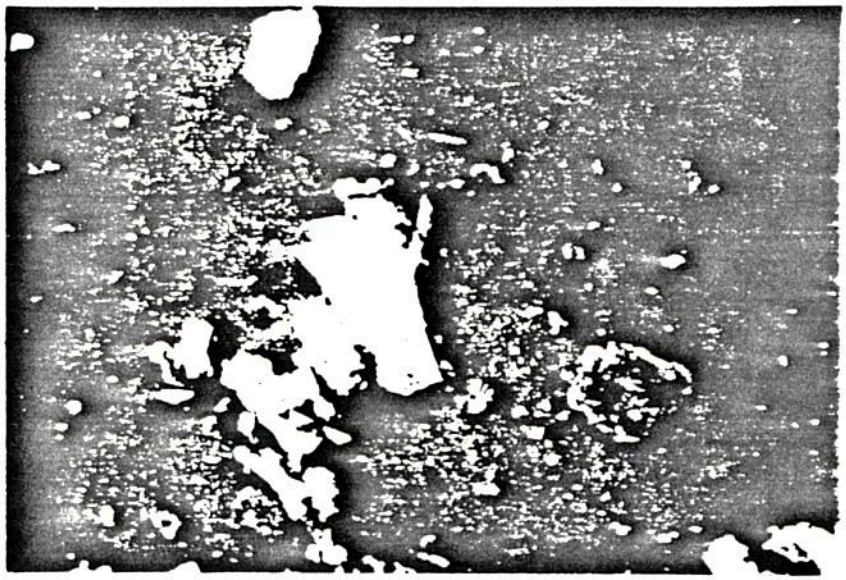
EDX of large crystal under the
long one in micrographs



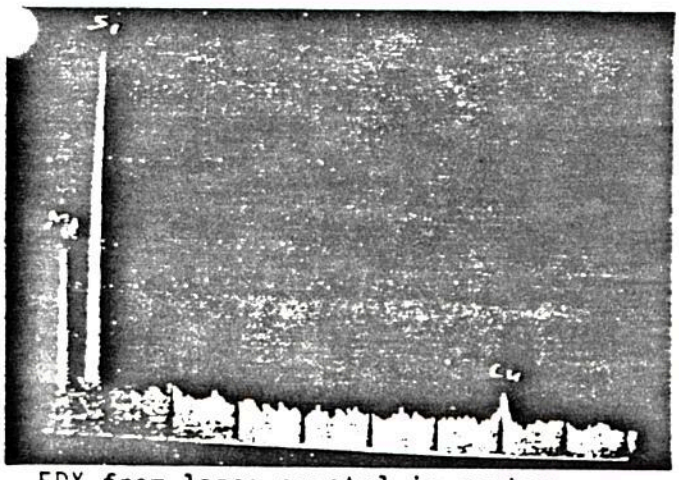
EDX of long crystal at left of
crossed crystals

Figure #2

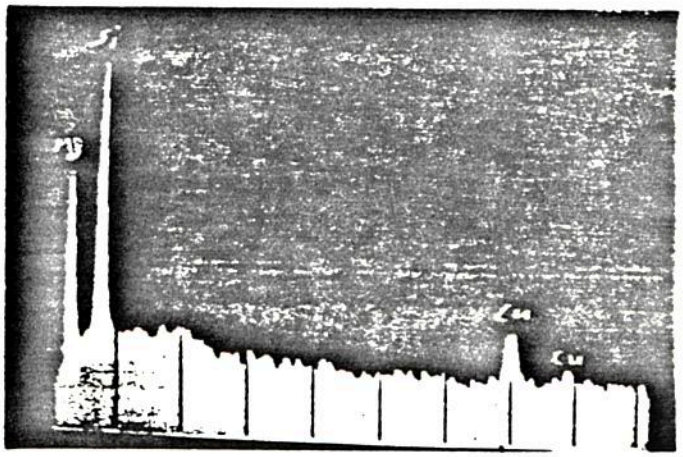
R.T. Vanderbilt Co. Sample # 67708



SEM micrograph of platy crystals (Talc)
in sample # 67708



EDX from large crystal in center
of micrographs



EDX from gray crystal in
micrographs

Figure #3

ROUTING AND TRANSMITTAL SLIP		ACTION
1 TO (Name, office symbol or location)	INITIALS	CIRCULATE
Irwin Katz	DATE	COORDINATION
2	INITIALS	FILE
	DATE	INFORMATION
3	INITIALS	NOTE AND RETURN
	DATE	PER CONVERSATION
4	INITIALS	SEE ME
	DATE	SIGNATURE

REMARKS

Irwin,

Enclosed are the samples you sent to RTI and to EPA for analysis, and the analytical results. RTI used PLM for the analysis and EPA used TEM/EDX. If you have any questions regarding these analyses, please call.

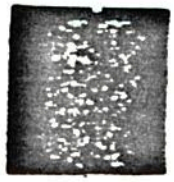
MKB.

Do NOT use this form as a RECORD of approvals, concurrences, disapprovals, clearances, and similar actions.

FROM (Name, office symbol or location)	DATE
Mike Beard	3/14/85
	PHONE FTS 629 2623

OPTIONAL FORM 41
AUGUST 1967
GSA FPMR (41CFR) 100-11.206

GPO 843—16—81418-1 619-015 5041-101



Memorandum

~~To:~~ Date: 2-22-'85

~~From:~~ "NYTALC 200" Gouverneur Talc. Sample #67708.

PLM analysis. No point count quantitation. Visual estimates to confirm EPA's quantitation in general terms only.

Contains: tremolite and tremolite-actinolite. Aspect ratios (3:1 and 10:1) percentages by EPA appear in range. Some anthophyllite. Also contains serpentine but no chrysotile was seen.

Asbestos Information Service/Referral Form

Contact Name: Erwin Katz

Affiliation: Governor Tale sample.

Address:

Telephone: 201 321 6715 ext. _____

Source of Contact

- ☐ Laboratory
- ☐ School
- ☐ Local/State Government
- ☐ Engineer
- ☐ Lawyer
- ☐ Federal Government
- ☐ Private Individual
- ☐ Contractor/Architect
- ☐ Other

Type of Information Requested

- ☐ Lab List
- ☐ Interim Method
- ☐ OTS/IA Office (800) 424-9065
- ☐ State/Regional Coordinator(s)
- ☐ NTIS (703) 487-4650
- ☐ CPSC (800) 638-2772
- ☐ Solid and Hazardous Waste Agencies
- ☐ DOT—Hazardous Materials (202) 426-2075
- ☐ Cancer Information Service (800) 422-6237
- ☐ USDOL/OSHA
- ☐ NIOSH
- ☐ EPA-QA
- ☐ Technical Sampling and Analysis
- ☐ Consulting Service(s)
- ☐ Information Search
- ☐ Other

Notes/Summary/Comments/etc.: Also discussed. See attached. Person need for definition, quantitation determination, etc.

Information Provided by: [signature] **Date:** 2-12-1985

Mailed by: _____ **Date:** __/__/__

INDUSTRIAL HYGIENE STUDY OF THE GOUVERNEUR TALC COMPANY NUMBER ONE MINE AND MILL BALMAT NEW YORK. PB81-224719

DEMENT, J. M. ZUMWALDE, R. D.

CORP. SOURCE- NATIONAL INST. FOR OCCUPATIONAL SAFETY AND HEALTH, CINCINNATI, OH. DIV. OF SURVEILLANCE, HAZARD EVALUATIONS AND FIELD STUDIES. JOURNAL VOL.- U8123 DESCPIP. NOTE- INDUSTRYWIDE STUDY (FINAL) REPORT DATE- OCT 76 PAGINATION- 37P REPORT NO.- IWS-36.12B NTIS PRICES- PC A03/MF A01

SAMPLES OF BULK TALC (14807966) PRODUCED BY THE R. T. VANDERBILT GOUVERNEUR TALC COMPANY (SIC-1496) NUMBER ONE MINE IN BALMAT, NEW YORK, WERE COLLECTED AND ANALYZED FOR ASBESTOS (1332214) CONTENT ON DECEMBER 12, 1975. TEN MILLIGRAMS OF EACH SAMPLE FROM SEVEN TALC SUPPLIERS WERE PREPARED AND ANALYZED BY TRANSMISSION ELECTRON MICROSCOPY. ASBESTIFORM ANTHOPHYLLITE (1332214) AND FIBROUS TREMOLITE (1332214) COMPRISED 67 TO 88 AND 4 TO 12 PERCENT OF THE FIBERS PRESENT IN THE SAMPLES, RESPECTIVELY. CHRYSOTILE (1332214) WAS FOUND IN TRACE AMOUNTS IN TWO OF THE SEVEN SAMPLES ANALYZED. RECOMMENDATIONS WERE MADE TO APPLY ASBESTOS WARNING LABELS TO THE SEVEN BULK TALCS.

He is nearby

No telling where your sample came from relative to your bag

Don

RESULTS OF U.S.P.H.S. SURVEY AT AMERICAN BRAKE SHOE WINCHESTER VIRGINIA. PB81-224701

CORP. SOURCE- NATIONAL INST. FOR OCCUPATIONAL SAFETY AND HEALTH, CINCINNATI, OH. DIV. OF SURVEILLANCE, HAZARD EVALUATIONS AND FIELD STUDIES. JOURNAL VOL.- U8123 DESCRIP. NOTE- INDUSTRYWIDE STUDY. REPORT DATE- MAY 71 PAGINATION- 11P REPORT NO.- IWS-32.25C NTIS PRICES- PC A02/MF A01

AIR SAMPLING FOR ASBESTOS (1332214) DUST WAS CONDUCTED BY THE UNITED STATES PUBLIC HEALTH SERVICE AT THE AMERICAN BRAKE SHOE COMPANY (SIC-3292) IN WINCHESTER, VIRGINIA, DURING MAY, 1971. THE CONCENTRATION OF FIBERS GREATER THAN 5 MICRONS IN LENGTH PER CUBIC CENTIMETER (F/CC) RANGED FROM UNMEASUREABLE TO 8.4F/CC FOR THE MIXING, COATING, AND EXTRUDING AREA; UP TO 5.2F/CC FOR THE FORMING AREA; 0.1 TO 7.0F/CC FOR HOT PRESSING OPERATIONS; 0.3 TO 2.1F/CC FOR THE BAKING AREA; 0.2 TO 17.5F/CC FOR GRINDING AND SANDING OPERATIONS; UP TO 5.4F/CC FOR THE CUTTING AND DRILLING WORK

MICROSCOPE ANALYSIS FOR GRAIN MORPHOLOGY DETERMINATION

LETTER REPORT

Prepared by

GCA/TECHNOLOGY DIVISION
Bedford, Massachusetts 01730

INTRODUCTION

GCA was tasked by the Stationary Source Compliance Division of U.S. EPA Region II to analyze a bulk sample in order to characterize its grain morphology. Specifically, the purpose of the analysis was to quantify the amount of asbestiform materials present in the sample. As directed by the EPA, the criteria used in doing the analysis was twofold: 1) A quantification using the fiber definition of any particle having an aspect ratio of 3:1 or greater, and 2) A quantification using the fiber definition of any particle having an aspect ratio of 10:1 or greater.

SAMPLE DESCRIPTION AND CUSTODY

The sample received at GCA consisted of a white, dry powder whose individual particles were distinguishable with the naked eye. The sample was contained in a plastic vial which was secured and intact upon receipt. Chain of custody forms accompanied the sample and they were signed and returned on receipt. The sample was logged in the GCA Master Sample Log, and given the GCA Control Number 41297.

SAMPLE PREPARATION

Four slides were prepared from the sample for observation under the transmitted polarized light microscope. Each slide was prepared in the glove box by mounting aliquots of the sample in immersion oils of various indices of refraction. This allowed for characterization of asbestiform materials other than tremolite. The aliquots were mounted on glass microscope slides and protected with glass coverslips. Much care was taken to preserve the original morphology of the grains during mounting.

SAMPLE ANALYSIS

The slides were analyzed by means of a polarized light microscope, fixed with an image-shearing eyepiece to estimate the aspect ratio of each particle. Particle characterization was carried out by applying classical crystallographic techniques, using magnifications ranging from 20X to 630X. One hundred non-void points were measured in each slide in order to determine grain morphology. Aspect ratios were determined by means of an image-shearing eyepiece which had been calibrated previously. The results from each slide were added up and the frequency of each category calculated from the total of 400 points. The same methodology described herein was employed for both determinations, namely, the 3:1 aspect ratio and the 10:1 criterion.

Positive identification of mineral grains requires the determination of at least the following optical properties:

- Morphology
- Color and Pleochroism
- Indices of Refraction
- Relief
- Birefringence
- Sign of Elongation
- Extinction Characteristics

1. Morphology - refers to the shape and size of the particle being analyzed. These measurements are carried out using both transmitted and reflected light. As stated above, aspect ratios are obtained by measuring the length and width of the particle by means of an image-shearing microscope eyepiece.

2. Color and pleochroism - The color of a particle can be established either with a microscope or the naked eye. Pleochroism is exhibited by those particles in which both vibration of light directions absorb different portions of the light spectrum. In such cases, a particle rotated within a beam of polarized light, is observed to transmit different colors according to the vibration direction that is parallel to the privileged direction of the polarizer.

3. Indices of Refraction - The index of refraction of a material can be defined as the ratio of the velocity of light in a vacuum (C) to the velocity of light in the material (Cm). For most materials, Cm is less than C, therefore refraction indices are generally greater than 1.0 in value. The refraction indices of transparent solids are commonly determined by immersing fragments of the solids in a series of liquids of known refractive index. In this study, the indices of refraction were determined by means of the Becke Line Method. In this method, a particle mounted in oil, viewed with the microscope objective focused slightly above the position of sharpest focus, will usually display two thin lines (one dark and one bright) concentric to its border. The higher of these is always closest to the material having the higher index of refaction; in addition, it always moves toward the medium having the higher refractive index, if viewed as the microscope is racked upward above the position of current focus.

When the Becke lines are not clearly defined, the indices of refraction were obtained by the Schroeder van der Kolk method, also known as the Oblique Illumination Method. In essence, the method involves the gradual insertion of an opaque stop into the optical light path and observation of the grain in the field of view of the microscope as the shadow of the stop approaches it. Usually, a grain whose refractive index is higher than that of the oil will become shadowed on the edges nearest the approaching shadow but bright on the opposite border; if the particle's index of refraction is lower than that of the oil, this will be reversed.

4. Relief - The degree of shadows along a grain's borders - that is, the degree of relief - grossly indicates how close the value of the grains refractive index is to that of the oil. In a close match, the grain shows little or no relief if viewed in the oil, that is, it is almost completely invisible. High relief is characterized by the presence of heavy shadows on the grain surfaces.

5. Birefringence - Anisotropic materials have more than one index of refraction. Possession of more than one refractive index is known as birefringence. The absolute value of a particle's birefringence can be obtained by subtracting the indices of refraction which correspond to the two principal vibration directions of the light in the particle.

6. Sign of Elongation - In elongated mineral grains, two possibilities exist with respect to the orientation of the two principal vibration directions: 1) If the fast direction is parallel (or within 45 degrees) to the elongation, the grain is said to posses a positive elongation; or 2) if the slow direction is parallel (or within 45 degrees) to the direction of elongation, in which case the grain is said to posses a negative elongation. The sign of elongation is obtained by turning the grain to the 45 degree position and inserting a gypsum plate. If the interference colors rise, the slow direction of the gypsum has been superimposed on the slow ray of the grain. If this is also the direction of elongation, it means that the grain has positive elongation. When the slow ray of the gypsum plate is parallel to the elongation of the grain and the interference colors fall, the grain has negative elongation.

7. Extinction Characteristics - Extinction refers to the position at which a birefringent substance on the stage of a polarizing microscope is dark when viewed between crossed nicols. The angle between the position of maximum brightness and total darkness is called the extinction angle, and it is read directly from the scale located in the microscope stage.

The optical properties described above were identified for all the grains observed in the point count. The values obtained for each property were then checked against the values listed in the accompanying table (modified from EPA Test Method 600/M4-82-020, December 1982).

RESULTS

Tables 2 and 3 present the results of point-counted grain morphology analysis using the 3:1 and 10:1 criteria, respectively. The percent distribution of each category is calculated directly as the ratio of counts for each category. It must be noted that the presence of asbestos materials other than tremolite is reported. In this case, ~~the material~~ the material is chrysotile, an asbestiform mineral which is commonly found in association with talc deposits.

QUALITY CONTROL

GCA's analytical personnel conducted the analysis of this sample during our routine on-going asbestos analysis program. Under this program, the microscopists conduct analysis of "blind" samples derived from the NIST Asbestos Bulk Sample Analysis QA program, and also carry out weekly quantification calibration by means of the point count method as described in 40 CFR Part 763, Appendix A, as amended September 1, 1982.

MINERAL	MORPHOLOGY COLOR	REFRACTIVE INDICES α	REFRACTIVE INDICES γ	BIREFRINGENCE	EXTINCTION	SIGN ELONGA
Chrysotile (asbestiform serpentine)	Wavy fibers. Fiber bundles have splayed ends and "kinks". Aspect ratio typically >10:1 Colorless , nonpleochroic.	1.493-1.560	1.517-1.562 (normally 1.556)	.002-.014	∥to fiber length	+ (length
Amosite (asbestiform grunerite)	Straight, rigid fibers. Aspect ratio typically >10:1. Colorless to brown, nonpleochroic or weakly so. Opaque inclusion may be present.	1.635-1.696	1.655-1.729 (normally 1.696-1.710)	.020-.033	∥to fiber length	+ (length s
Crocidolite	Straight, rigid fibers. Thick fibers and bundles common, blue to purple-blue in color. Pleochroic. Birefringence is generally masked by blue color.	1.654-1.701	1.668-1.717 (normally close to 1.700)	.014-.016	∥to fiber length	(length fa
Anthophyllite-asbestos	Straight, single fibers, some larger composite fibers. Anthrophyllite cleavage fragments may be present with aspect ratios <10:1. Colorless to light brown.	1.596-1.652	1.615-1.676	.019-.024	∥to fiber length	+ (length sl
Tremolite-actinolite-asbestos	Tremolite-asbestos may be present as single or composite fibers. Tremolite cleavage fragments may be present as single crystals with aspect ratios <10:1. Colorless to pale green.	1.599-1.668	1.622-1.688	.023-.020	Oblique extinction 10-20° for fragments. Composite fibers show extinction.	+ (length sl
Talc	Usually massive foliated or fibrous aggregates or globular stellar groups. Colorless, white pale green, dark green, brown	1.539-1.550	1.589-1.600	.030-.050		(length fas

TABLE 1. PHYSICAL AND OPTICAL PROPERTIES OF ASBESTOS MINERALS

TABLE 2: Asbestiform versus non-Asbestiform materials based on the fiber definition of 3:1 or greater aspect ratio

Slide #	Asbestiform Tremolite Count (%)	Non-Asbestiform Tremolite Count (%)	Talc Count (%)	Other Asbestiform Material Count (%)	Other Non-Asbestiform Materials Count (%)
I	18	44	29	5	4
II	17	46	28	7	2
III	16	38	32	9	5
IV	17	39	32	6	6
Average %:	17	42	30	7	4

STATE OF NEW YORK
DEPARTMENT OF HEALTH OFFICE OF PUBLIC HEALTH

CORNING TOWER • THE GOVERNOR NELSON A. ROCKEFELLER EMPIRE STATE PLAZA • ALBANY, N.Y. 12201

DAVID AXELROD, M.D.
Commissioner

LINDA A. RANDOLPH, M.D., M.P.H.
OPH Director

DAVID O. CARPENTER, M.D.
Center Director

COPIES TO:
G. NOWAK
D. STONE

ORIGINAL TO ME

February 25, 1985

Mr. Irwin Katz
US EPA
Technical Support Group
Region II
Edison, NJ 08837

Dear Mr. Katz:

I've attached a copy of my report to Sam Syrotynski concerning the commercial "talc" product you analyzed earlier. The X-ray detector on our HVEM is still down so I haven't done further analysis. If you have any questions about this analysis, please call me at (518)473-4854.

Sincerely,

James S. Webber
Research Scientist II
Laboratory of Inorganic Analytical Chemistry

JSW:sl

Att.

Mr. Samuel Syrotynski

Mr. James S. Webber

December 19, 1984

St. Lawrence County Bulk Samples

All bulk (soil and ore) samples collected to date as part of the St. Lawrence County survey have been analyzed. Analysis of vegetative samples will remain unfinished because of the decomposition of leaf tissue. Air and water samples are being prepared for TEM reanalysis by a promising new technique. Soil samples listed on the attached sheet were analyzed by the point-counting PLM method after ashing. Identification of ore samples was done by PLM-DS and with the help of Dr. Philip Whitney, NYS Geological Survey. Note that 584-2 and 884-3 were mistakenly identified as tremolite in our earlier report.

Also listed are the analytical results of the NYTAL 200 sample supplied by the E.P.A. It was hoped that concurrent diffraction and x-ray elemental analyses could be performed on this sample with the Center's HVEM, but the x-ray detector has been out of service for a month. The results for this sample were consequently derived from PLM-DS, SEM-EDS and TEM-CBED, all of which are in agreement.

JW:sl

ST. LAWRENCE COUNTY
RESULTS OF ANALYSIS OF BULK SAMPLES

Type	Identification Lab. No.	Field No.	Analytical Method	Results	Remarks
Soil	S84-18	3.2	Point PLM	Nonfibrous - 100%	
Soil	S84-19	3.4	Point PLM	Nonfibrous - 100%	
Soil	S84-20	3.5	Point PLM	Nonfibrous - 100%	
Soil	S84-21	3.7	Point PLM	Nonfibrous - 96% Acicular - 4%	
Soil	S84-22	3.9	Point PLM	Nonfibrous - 98% Acicular - 1.5% Fibrous - 0.5% (vegetative)	
Soil	S84-23	3.11	Point PLM	Nonfibrous - 99% Acicular - 0.5% Fibrous 0.5% (vegetative)	
Rock	AB-1	AB-1	PLM-DS	Tremolite	
Rock	AB-3	AB-3	PLM-DS	Tremolite/talc	
Ore	S84-2 & 3	S84-2 & 3	PLM-DS SEM-EDS TEM-CBED	Wollastonite	Morphological distribution remains the same (less than 1/3 nonfibrous)
Product	S84-24	NYTAL 200 EPA-67708	PLM-DS Point PLM SEM-EDS TEM-CBED	Nonfibrous - 69% Acicular - 13.5% Fibrous - <1.605-13% >1.605-3.5% undeterm.-1.0%	Nonfibrous minerals are primarily tremolite with some quartz. Short-fibered minerals are tremolite and anthophyllite. Long-fibered minerals are primarily anthophyllite, with approximately 5-10% with aspect ratios exceeding 10.

TABLE 3: Asbestiform versus non-Asbestiform materials based on the fiber definition of 10:1 or greater aspect ratio

Slide #	Asbestiform Tremolite Count (%)	Non-Asbestiform Tremolite Count (%)	Talc Count (%)	Other Asbestiform Material Count (%)	Other Non-Asbestiform Materials Count (%)
I	8	46	35	5	6
II	6	45	41	3	5
III	6	48	41	4	1
IV	9	47	33	5	6
Average %:	7	47	38	4	5

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II

DATE: JUN 24 1986

SUBJECT: R.T. Vanderbilt Talc Sample Analysis

FROM: Barbara Metzger, Director
Environmental Services Division

TO: Conrad Simon, Director
Air & Waste Management Division

The Technical Support Branch has had the capability to analyze bulk samples for the presense of asbestos for several years. This capability was originally developed to support the Asbestos in Schools Program under TSCA. Regulations promulgated under this program require analyses of bulk samples by Polarized Light Microscopy (PLM) with Dispersion Staining (DS) supplemented by X-Ray Diffraction (40 CFR Part 763.109). Other analytical techniques are also available including Scanning Electron Microscopy (SEM), Transmission Electron Microscopy (TEM), and Selected Area Electron Diffraction (SAED).

More recently we have been requested by the Air Compliance Branch to analyze bulk samples collected at demolition sites for evaluating compliance with the National Emission Standard for Hazardous Air Pollutants (NESHAP) standard for asbestos (40 CFR Part 161.140 to 161.156).

In July 1984, the Technical Support Branch was requested to analyze a bulk sample of talc from the R. T. Vanderbilt & Co., Gouverneur Talc Facility for the presence of asbestos. Our analysis indicated that the sample contained the asbestos mineral tremolite. As a result of our analysis, a meeting was held with representatives of R. T. Vanderbilt Company, Office of Regional Counsel, and Air Compliance Branch to discuss our findings. R. T. Vanderbilt agreed with our finding, but claimed that although their product contains tremolite it is the non-asbestos (non-fibrous) variety. As a result of this meeting, samples were sent to a contract laboratory (GCA Corp.), the New York State Department of Health (NYSDOH) and the EPA Atmospheric Science Research Laboratory at Research Triangle Park for analysis. Using various methods including PLM, SEM and TEM, all three laboratories reported finding asbestiform (fibrous) tremolite, NYSDOH reported finding anthophyllite and GCA Corp. reported finding chrysotile. A sample was also sent to Dr. Anne Wylie at the University of Maryland at the request of R.T. Vanderbilt & Co. who did not report finding any fibrous asbestos minerals.

Presently, the Air Compliance Branch is contemplating sending a sample to the National Bureau of Standards (NBS) for analysis and have requested our input regarding the appropriate analytical method for NBS to use. In our opinion it is not a question of methodologies that result in differing conclusions, but a question of definition. The TSCA regulations

(40 CFR Part 763.103(c)) define asbestos as the asbestiform (fibrous) variety of tremolite, amosite, chrysotile, anthophyllite, crocidolite and actinolite. The method cited in §763.109 defines asbestos fibers as having an aspect ratio >3:1. The NESHAP regulations are not, however, specific in regard to defining what is an asbestos fiber (40 CFR Part 61.141). A legal interpretation is needed to determine if the TSCA definition of a fiber is appropriate (>3:1 aspect ratio) in this case. Until this decision is reached, we do not recommend additional analyses by NBS. Furthermore, if additional analyses are conducted, we would recommend that W.C. McCrone Associates also analyze the sample in view of their reputation in microscopy.

We are prepared to meet with your staff to discuss the technical aspects of this case. Please contact Thomas Fikslin at (FTS) 340-6711 to arrange a meeting.

cc: F. Giaccone, AWM-AC
D. Sullivan, ES-TS
D. Stone, ORC
T. Fikslin, ES-TS